

Introduction

The South Florida Water Management District (SFWMD or District) develops and updates regional water supply plans to address current and future water needs while protecting central and southern Florida's water resources. This *2022 Lower West Coast Water Supply Plan Update* (2022 LWC Plan Update) assesses existing and projected water demands as well as water sources to meet those demands through 2045.

The LWC Planning Area includes all of Lee County, most of Collier County, and portions of Charlotte, Glades, Hendry, and Monroe counties and the Seminole Tribe of Florida Immokalee Reservation (**Figure 1-1**). The portions of the Big Cypress National Preserve and Monroe County within the LWC Planning Area have no permanent residents. The 2022 LWC Plan Update presents population estimates and associated water demands and projections (**Chapter 2**), water resource and water supply development projects (**Chapters 7 and 8**, respectively), and related water supply planning information for the 2020 to 2045 planning horizon. Designed to be a planning guide for local and tribal governments, utilities, agricultural operations, and other water users, the 2022 LWC Plan Update provides a framework for local and regional water supply planning and management decisions in the LWC Planning Area.

The LWC Planning Area covers more than 5,100 square miles and generally reflects the drainage patterns of the Caloosahatchee River Basin to the north and Big Cypress National Preserve to the south. The northern area of the Caloosahatchee River Basin is also the general jurisdictional boundary between the SFWMD and the Southwest Florida Water Management District in Charlotte County. The eastern boundary of the LWC Planning Area is along the western edge of the historic Everglades watershed, dividing the Big Cypress and Lake Okeechobee drainage basins. The southern end of the LWC Planning Area encompasses a coastal portion of Everglades National Park and ends just north of Shark River Slough.

The LWC Planning Area also includes extensive natural systems, including the Caloosahatchee River Estuary, Okaloacoochee Slough State Forest, Lake Trafford, Corkscrew Regional Ecosystem Watershed, Big Cypress Swamp, Picayune Strand State Forest, southern Charlotte Harbor, Estero Bay, Naples Bay, Ten Thousand Islands National Wildlife Refuge, J. N. "Ding" Darling National Wildlife Refuge, Rookery Bay National Estuarine Research Reserve, and Fakahatchee Strand Preserve State Park (**Figure 1-1**).

TOPICS

- ◆ 2022 LWC Plan Update
- ◆ Goal and Objectives
- ◆ Legal Authority and Requirements
- ◆ Seminole Tribe of Florida
- ◆ Regional and Local Planning Linkage
- ◆ Plan Development Process
- ◆ Progress Since the 2017 LWC Plan Update



Figure 1-1. Lower West Coast Water Supply Planning Area.

The primary sources of fresh water throughout the LWC Planning Area are surface water and groundwater from shallow aquifers. To a much lesser extent, reclaimed water also is used for non-potable uses like irrigation. Major surface water resources include Lake Okeechobee, the Caloosahatchee River, and their hydraulically connected water bodies. The availability of surface water in the LWC Planning Area is limited, primarily due to water resource protection criteria (**Chapter 4**). Groundwater resources in the LWC Planning Area include the surficial, intermediate, and Floridan aquifer systems (SAS, IAS, and FAS). Further information about water source options is provided in **Chapter 5**.

2022 LWC PLAN UPDATE

The 2022 LWC Plan Update reflects the changes experienced in the LWC Planning Area since 2017, and their effect on water use and updates to projected water demands from 2040 to 2045. The 2022 LWC Plan Update consists of two documents: the planning document with appendices, and the *Support Document for the 2021-2024 Water Supply Plan Updates* (2021-2024 Support Document; SFWMD 2021). The planning document with appendices focuses on the LWC Planning Area. The 2021-2024 Support Document discusses aspects common to four of the SFWMD regional planning areas, including the legal authority and requirements for water supply planning. The Upper Kissimmee Basin is not included in the 2021-2024 Support Document because it is part of the Central Florida Water Initiative, which has its own support documents.

GOAL AND OBJECTIVES

The goal of the 2022 LWC Plan Update is to identify sufficient water supply sources and future projects to meet existing and future reasonable-beneficial uses during 1-in-10-year drought conditions through 2045 while sustaining water resources and natural systems. The objectives of the 2017 LWC Plan Update were reviewed and updated to develop the following objectives for this 2022 LWC Plan Update:

1. **Water Supply** – Quantify sufficient volumes of water and water supply projects to meet reasonable-beneficial consumptive uses projected through 2045 under 1-in-10-year drought conditions.
2. **Natural Systems** – Protect and enhance natural systems and water resources from harm due to water use, including declining water levels and the harmful movement of saline water.
3. **Water Conservation and Alternative Source Development** – Encourage water conservation measures to improve water use efficiency. Continue to encourage development of the FAS as an alternative water supply (AWS) and monitor the aquifers to enhance understanding of the relationships among water use, water levels, and water quality. Develop water storage options, including aquifer storage and recovery (ASR) systems and reservoirs, and promote projects that increase the supply and use of reclaimed water.
4. **Linkage with Local and Tribal Governments** – Provide information to support local government Comprehensive Plans. Promote compatibility of the 2022 LWC Plan Update with local and tribal government land use decisions.

5. **Compatibility and Linkage with Other Efforts** – Achieve compatibility and integration with the following planning-related activities:
- ♦ Other state and federal water resource initiatives in the LWC Planning Area
 - ♦ Existing and proposed environmental projects
 - ♦ Development and modifications to operating schedules for regional projects (e.g., Caloosahatchee River [C-43] West Basin Storage Reservoir) and regional systems (e.g., Lake Okeechobee)
 - ♦ Water use permitting process, minimum flow and minimum water level (MFL) criteria, water reservations, and restricted allocation areas (RAAs)

LEGAL AUTHORITY AND REQUIREMENTS

The legal authority and requirements for water supply planning are included in Chapters 163, 187, 373, and 403, Florida Statutes (F.S.). In accordance with Florida’s Water Protection and Sustainability Program, regional water supply plans and local government Comprehensive Plans must ensure that adequate potable water facilities are constructed and concurrently available to meet the demands of new development. The water supply planning region identified in this plan shall be considered a Water Resource Caution Area under Section 403.064, F.S., and affected parties may challenge the designation pursuant to Section 120.569, F.S.

In addition to water supply planning, the SFWMD is required by statute to provide updates for a variety of resource development, restoration, and monitoring programs implemented within the District’s boundaries. Such updates are provided in the annual publication of the *South Florida Environmental Report*, which is referenced as needed in this plan update.

SEMINOLE TRIBE OF FLORIDA IMMOKALEE RESERVATION

The Seminole Tribe of Florida is a federally recognized Indian Tribe organized pursuant to Section 16 of the Indian Reorganization Act of 1934 and recognized by the State of Florida pursuant to Chapter 285, Florida Statutes. The Seminole Tribe of Florida’s Immokalee Reservation encompasses 600 acres within the central portion of the LWC Planning Area (**Figure 1-1**). The reservation has a population of fewer than 1,000 permanent residents.

REGIONAL AND LOCAL PLANNING LINKAGE

The SFWMD’s regional water supply planning process is closely coordinated and linked to the local water supply planning of municipal/county governments and utilities. Coordination and collaboration among all water supply planning entities is needed throughout the regional water supply plan development and approval process.

While this 2022 LWC Plan Update addresses regional and Districtwide water supply issues, local governments are required to plan for their water and wastewater needs (as well as other infrastructure and public service elements) through their Comprehensive Plans. Local Comprehensive Plans also include Water Supply Facilities Work Plans (Work Plans), which are required by statute. In addition, local governments are required by statute to update their

Work Plans and adopt revisions to their Comprehensive Plans within 18 months following approval of this 2022 LWC Plan Update. Revisions may include population projections, established planning periods, existing and future water supply development projects, intergovernmental coordination activities, conservation and reuse measures, and the capital improvements element. More information on Comprehensive Plan and Work Plan requirements is provided in the 2021-2024 Support Document (SFWMD 2021).

To assist local governments in updating their Comprehensive Plans and Work Plans, the SFWMD has developed technical assistance tools and informational documents, which are available on the SFWMD website (<https://www.sfwmd.gov/doing-business-with-us/work-plans>). Additional information about developing a Work Plan is available from the Florida Department of Economic Opportunity website (<https://www.floridajobs.org/community-planning-and-development/programs/community-planning-table-of-contents/water-supply-planning>).

PLAN DEVELOPMENT PROCESS

This 2022 LWC Plan Update describes how anticipated water supply needs will be met in the LWC Planning Area through 2045. The planning process used to develop this 2022 LWC Plan Update is outlined below.

PLAN DEVELOPMENT PROCESS 			
1 Planning and Assessment <p>The process incorporated public participation and coordination with local stakeholders, including water supply utilities, agricultural operations, nongovernmental environmental groups, local and tribal governments, the Florida Department of Environmental Protection, the Florida Department of Agriculture and Consumer Services, and other appropriate state and federal agencies. A review of previous planning efforts in the region and documentation of activities since the approval of the 2017 LWC Plan Update were key starting points.</p>	2 Data Collection, Analyses, and Issue Identification <p>Using the 2017 LWC Plan Update as a foundation, developing this plan update involved collecting the latest information on current and projected population and water demands (Chapter 2), water conservation (Chapter 3), water resource protection (Chapter 4), water source options (Chapter 5), and water resource analyses (Chapter 6).</p>	3 Evaluation of Water Resources and Water Source Options <p>This phase of the planning process involved reviewing existing monitoring data and updated regional modeling used for evaluation of water resources to identify issues. Where projected demands exceed available supplies, water supply project options were identified, including alternative water supplies and water conservation.</p>	4 Identification of Water Resource and Water Supply Development Projects <p>Where resource conditions warranted, water resource development projects were identified (Chapter 7). Water supply development projects intended to meet water needs over the planning horizon were identified, compiled, and evaluated by the SFWMD with input from stakeholders, the public, and other agencies. The SFWMD also considers water supply projects in local government Work Plans, Tribal Work Plans, and adopted Sector Plans, which are required to identify needed water supplies and available water sources, Section 163.3245(3)(a)2., F.S. Additionally, the projects were screened for permitting feasibility (Chapter 8).</p>

Public Participation

Public participation is a key component of the water supply plan development process to ensure the plan addresses the issues and concerns of stakeholders and that the direction and projects are appropriate for future water needs. The SFWMD held three virtual stakeholder workshops for this water supply plan update. Stakeholders representing a variety of interests in the region, such as agriculture, industry, environment, utilities, local government planning departments, tribal representatives, and state and federal agencies as well as the general public, were invited to attend the workshops. The workshops provided participants with an opportunity to review and comment on projected demands, water supply issues, the condition of regional water resources, water source options, groundwater modeling, and other key aspects of the water supply plan update.

Individual meetings were held throughout the planning process with public supply utilities, the Seminole Tribe of Florida, other planning agencies, local government planning departments, and agricultural representatives to discuss water demand projections and coordinate planning efforts. During meetings with the region's major utilities and local governments, population and demand estimates and projections were reviewed and verified, and the condition of regional water resources and AWS development efforts were discussed. Additionally, presentations were made to the District's Governing Board and the Big Cypress Basin Governing Board, providing overviews of the plan update and soliciting comments. Following the public comment period, the final version of the plan update was brought to the District's Governing Board for consideration of approval.

PROGRESS SINCE THE 2017 LWC PLAN UPDATE

Since the 2017 LWC Plan Update, the following activities and programs in the LWC Planning Area are enhancing the region's water resources, water supply, and natural systems.

Modeling and Hydrologic Studies

- ◆ **FAS Monitoring Network** – The SFWMD maintains and updates a network of 106 FAS monitor wells, 18 of which are within the LWC Planning Area. Water level data from the monitor wells are evaluated to help manage use of the FAS as a water supply source. In addition, water quality sampling and analyses are conducted periodically to observe any trends that might signal overuse of the resource.
- ◆ **Lower West Coast Surficial and Intermediate Aquifer Systems Model** – The Lower West Coast Surficial and Intermediate Aquifer Systems Model (LWCSIM) was completed and simulations to evaluate changes in water levels in the SAS and IAS for the 2014 and 2040 withdrawal scenarios were completed during 2020.
- ◆ **West Coast Floridan Model** – The West Coast Floridan Model (WCFM) was updated and simulations to identify potential changes in water quality, flows, and water levels in the FAS for the 2014 and 2040 withdrawal scenarios were conducted during 2020. **Chapter 6** provides information about both modeling efforts for this plan update.
- ◆ **Hydrogeologic Studies** – Between 2017 and 2020, the SFWMD and its partners completed the following hydrogeologic investigations in the LWC Planning Area:
 - ◆ Aquifer performance testing of the Sandstone aquifer (Smith 2017)

- ♦ Geochemistry of the Upper Floridan aquifer and Avon Park permeable zone (Geddes et al. 2018)
- ♦ Groundwater chemistry of the Lower Floridan aquifer – upper permeable zone in Central and South Florida (Geddes et al. 2020)
- ♦ **Updated Delineation of the Saltwater Interface in Collier and Lee Counties** – The SFWMD reviewed water quality data from Collier and Lee counties and updated maps to compare the 2009, 2014, and 2019 extent of saltwater intrusion within the SAS and IAS (Shaw and Zamorano 2020). See **Chapter 6** for more details.

Water Supply Studies

- ♦ **Annual Estimated Water Use Reports** – The SFWMD prepared annual reports that summarize estimated use (based on reported withdrawals) for public supply, domestic self-supply, commercial/industrial, agriculture, landscape/recreational, and power generation. A copy of the annual reports can be found at <https://www.sfwmd.gov/our-work/water-supply>.
- ♦ **2022 Water Supply Cost Estimation Study** – The SFWMD funded an engineering evaluation of the capital and operational costs of various water supply facilities including groundwater wellfields, surface facilities, water treatment processes, storage, piping and distribution facilities, and other ancillary components. It is anticipated that the study report will be available in 2022.

Water Storage, Construction, and Restoration Projects

- ♦ **Herbert Hoover Dike/Lake Okeechobee** – In 2007, the United States Army Corps of Engineers (USACE) designated the Herbert Hoover Dike as a Class I risk, the highest risk for dam failure. Of the 32 culverts slated to be replaced, removed, or abandoned, 27 have been completed and the remaining 5 are under construction. The Dam Safety Modification Study identified 56.3 miles of the dam as needing improvement, of which 40 miles (71%) have been completed. Construction of all works are currently scheduled for completion by the end of 2022.



Herbert Hoover Dike

- ◆ **Lake Okeechobee Watershed Restoration Project** – Part of the Comprehensive Everglades Restoration Plan (CERP), the purpose of the Lake Okeechobee Watershed Restoration Project is to improve the ecology of Lake Okeechobee, decrease regulatory releases to the St. Lucie and Caloosahatchee estuaries, restore freshwater wetlands in the watershed, and improve water supply for existing legal users. The project team prepared a Final Integrated Project Implementation Report and Environmental Impact Statement that was released in August 2020 for public review. A Final Chief's Report by the USACE Chief of Engineers and congressional authorization are pending for the project. The recommended plan includes construction of up to 55 ASR wells located in clusters throughout the Lake Okeechobee watershed. To date, the Florida State Legislature appropriated \$100 million (\$50 million in Fiscal Year [FY] 2020 and \$50 million in FY2021) to the SFWMD for the design, engineering, and construction of the specific project components designed to achieve the greatest reductions in harmful discharges to the St. Lucie and Caloosahatchee estuaries.
- ◆ **Picayune Strand Restoration Project** – Part of CERP, the purpose of the Picayune Strand Restoration Project is to restore and enhance wetlands in the Picayune Strand State Forest and adjacent public lands by reducing overdrainage, and to improve the water quality of coastal estuaries by moderating the large salinity fluctuations caused by point discharge of fresh water from the Faka Union Canal. Over 55,000 acres of wetland and upland habitat will be restored or enhanced for fish and wildlife resources, including threatened and endangered species. The Merritt Pump Station was completed in April 2016, Faka Union Pump Station in January 2017, and Miller Pump Station in May 2018. Plugging of the upper 3 miles of the Faka Union Canal and the East-West canals was completed in May 2021. The Southwest Protection Feature levee will provide flood protection for existing agricultural and residential properties with an anticipated completion date of 2023.
- ◆ **CERP Caloosahatchee River (C-43) West Basin Storage Reservoir** – Part of CERP, the purpose of the Caloosahatchee (C-43) West Basin Storage Reservoir is to improve timing and quantity of water deliveries to the Caloosahatchee Estuary, capture stormwater runoff and Lake Okeechobee releases, and meet the MFL established for the Caloosahatchee Estuary. The project team completed the Package 1 Preload and Demolition in August 2017 to remove all existing agricultural facilities and consolidate the foundation beneath the surface to prevent settling. The Package 2 Irrigation Pump Station (S-476) was completed in April 2019. This pump station replaces the need for local drainage district pump stations. The Package 3 Inflow Pump Station (S-470) and the Package 4 Civil Works (dam embankment and associated structures) are currently under construction.
- ◆ **C-43 Water Quality Feasibility Study** – The Caloosahatchee Reservoir Water Quality Study provides options for water quality improvement opportunities for water leaving the Caloosahatchee Reservoir. After extensive public and stakeholder engagement, Phase 1 of the study is complete and identifies four water quality treatment opportunities. Phase 2 is under way and includes siting of the possible alternatives to determine cost and compatibility with other infrastructure.

- ◆ **Caloosahatchee MFL Criteria and Recovery Strategy Revisions** – In December 2019, the MFL for the Caloosahatchee River was modified to be a 30-day moving average flow of 457 cubic feet per second (cfs) at control structure S-79 (Section 40E-8.221, Florida Administrative Code [F.A.C.]). The MFL recovery strategy includes several components and is fully described in **Appendix C**. Two components involve construction of the C-43 Reservoir and implementation of a research and monitoring plan. Construction of the C-43 Reservoir began in 2015 and is scheduled to be completed in 2023. Water to be stored in the reservoir has been protected with a water reservation. The research and monitoring plan is meant to document ecological responses of indicators before and after operation of the C-43 Reservoir to determine the benefits of additional future freshwater inflows from the reservoir.
- ◆ **Lake Hicpochee Hydrologic Enhancement Project** – The Lake Hicpochee Storage and Shallow Hydrologic Enhancement Project captures water from the C-19 Canal that discharges into the C-43 Canal. The project holds water in shallow storage and redistributes it into Lake Hicpochee to reduce harmful discharges to the Caloosahatchee Estuary.
- ◆ **Southern Corkscrew Regional Ecosystem Watershed (CREW)** – The State of Florida and SFWMD have partnered with other government agencies and conservation organizations to acquire 45,000 acres of the vast CREW. The Southern CREW hydrologic enhancement project consists of a 4,150-acre mosaic of wet prairies, native uplands, freshwater marsh, hydric pine flatwoods, and cypress strand wetlands. The project goal was to restore historical sheetflow and reduce excessive freshwater discharges which include nutrients and pollutants to Estero Bay during the rainy season. This was accomplished by backfilling canals and degrading dirt roads and berms that crisscrossed the entire project area resulting in approximately 437 acres of restored wetlands that had been suffering due to reduced hydrology. The final project design and permitting was completed in 2013. Construction of the Southern CREW project was initiated in February 2016 and completed in April 2018. The SFWMD has led this restoration effort. Based on the vegetation and hydrologic monitoring efforts to date, a trend of appropriate wetland vegetation recruitment has been observed, and it is anticipated that as a result of the hydrologic enhancements, further increases in native wetland vegetation will follow.

Alternative Water Supply and Water Conservation Cost-Share Funding

As part of the regional water supply plans' water resource development component (**Chapter 7**), and to assist local water users in implementation of the water supply development component (**Chapter 8**), the SFWMD periodically provides funding assistance to public water suppliers, local governments, special districts, homeowners' associations, water users, and other public and private organizations for AWS and water conservation projects that are consistent with the SFWMD's core mission. In 2019, the Florida Department of Environmental Protection and SFWMD initiated annual funding for the construction and implementation of AWS and water conservation projects to qualified applicants through the AWS Funding Program.

- ◆ **Alternative Water Supply** – From FY2017 through FY2021, the SFWMD provided AWS project funding for seven projects that were completed or are under construction in the LWC Planning Area, generating 9.87 million gallons per day (mgd) of additional water capacity.

- ◆ **Water Conservation** – From FY2017 through FY2021, the SFWMD provided funding for three water conservation projects that were completed or are being implemented in the LWC Planning Area. The projects are estimated to save 0.08 mgd.

Big Cypress Basin Initiatives

The Big Cypress Basin Board has oversight responsibilities for operation and maintenance of a network of 143 miles of primary canals and 36 water control structures. Big Cypress Basin facilities are operated in coordination with local governments. A 5-year strategic plan was prepared by the Big Cypress Basin in 2018, which included capital improvements to water management infrastructure, water supply, environmental, and flood control components. Within the past 5 years, numerous improvements to the system infrastructure, flood control components, and operational modifications have taken place.

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